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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,487	04/16/2004	Bo Zheng	007589/PPC/ECP	1358

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EXAMINER
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GEORGE, PATRICIA ANN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/826,487

Applicant(s)

ZHENG ET AL.

Examiner

Patricia A. George

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/1/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the term "the bevel" renders the claim indefinite because it is unclear what specifically "the bevel" is referring to. Both applicants' specification and claim 10 cite "the beveled edge" which is very clear language. Claims 2-9 are rendered indefinite as they are dependent or interdependent on the above claim 1.

Regarding claims 4, 10, and 17, the term "drop" renders the claim indefinite because it is unclear what specifically the unit "drop" is referring to. Claims 5, 11-16, and 18-23 are rendered indefinite as they are dependent or interdependent on the above claims 4, 10, and 17.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1-3, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nayak et al. of USPN 6,494,219 in view of Uzoh et al. of USPN 6,056,869.

Nayak et al. of USPN 6,494,219 teaches a method and apparatus with etchant for removing unwanted deposits (col. 1, lines 14-16) from the beveled edge of the wafer (fig. 2A, part 33). When the substrate is in the pre-process position, the actuator rotates (col.8 line 43) the spindle (fig. 1, part 518). Which is supported by a vacuum chuck (fig.1, part 516), an etching solution is dispensed onto the beveled edge of the production surface of the substrate (col.8-9, lines 66-3) with a rotating (i.e. pivot) nozzle (fig. 5, part 150); and dispensing DI water (as in claim 3), from a second adjustable fluid dispensing nozzle (col. 2., line 55-63). Nayak teaches the flow of fluid is prescribe by use of valves via a controller (col.9, l.25-35), which would allow the user to prescribe to a simultaneous dispense.

Although Nayak does not "refer" to the use of a protective fluid, Nayak is considered to encompass the use of a protective fluid because discloses dispensing DI water which is the same protective fluid claimed by applicants' in claim 3.

Uzoh et al. teaches use of DI water to protect a portion of the wafer (col.2, l.33) from an etchant (col. 6l. 12-13).

Although Nayak is silent about dispensing the protective fluid (i.e. DI water) in the center of the wafer, Nayak does teach nozzles in ERB systems can be adjusted to direct etchant and/or water at desired locations on the substrate.

Therefore It would have been obvious to one of ordinary skill in the art at the time of invention was made, to dispense DI water in the central portion of the wafer, in the process of Nayak, because Uzoh illustrates that use of water prevents an etchant from maintaining substrate real estate, and Nayak teaches nozzles can be adjusted to desired locations. One of ordinary skill desiring to etch the beveled edge, in Nayak, would be motivated to dispense the protective fluid (i.e. DI water) in the center of the wafer in order to selectively etch the edge of the wafer and not the center of the wafer, because the teachings of Nayak and Uzoh make such a provision.

Nayak et al., is silent as to dispensing de-ionized water onto a backside of the substrate during the dispensing of the etching solution, as in claim 9.

As for claim 9, Uzoh et al. of USPN 6,056,869 teaches dispensing deionized water onto a backside of the substrate to protect the surface during the dispensing of the etchant (see figure 3A).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of removing unwanted deposits with cleaning acids from the beveled edge of the wafer, as Nayak et al., to include

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dispensing de-ionized water onto a backside of the substrate during the dispensing of the etching solution, because Uzoh teaches the DI water protects the wafer.

As to claim 2, Nayak et al., teaches use of cleaning acids, such as sulfuric acid (col. 7, line 38).

***Claim Rejections - 35 USC § 103***

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nayak et al. and Uzoh et al. as applied to claims 1, 3, and 9 above, and further in view of Ohmi et al of USPN 5,487,398.

The modified teaching of Nayak et al., do not teach dispensing the etching solution at 0.25L/min to 2.5L/min for 3-10 seconds, as in claim 7, and rotating the substrate at 100 –300 rpm, as in claim 8.

As for claim 7, Ohmi et al. teaches rotary cleaning of wafers using the flow rate of 100-500 ml/min which overlaps the range claimed 0.25L/min to 2.5L/min for 3-10 seconds; and using an automatic control system that allows the user to set the feed time to an optimum time (col.11, lines 30-50).

As for claim 8, Ohmi et al. teaches a spin speed of 100 to 400 rpm which encompasses the claimed limitation.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of removing unwanted deposits with cleaning acids from the beveled edge of the wafer, as in the modified teachings of

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Nayak et al., to include the flow rate, time, and speed of Ohmi et al, because Ohmi teaches using silicon wafers with cleaner surface decreases the total cost (of production) by producing high-performance semiconductor (see abstract).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia (Patty) George whose telephone number is (571)272-5955. The examiner can normally be reached on weekdays between 7:00am and 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571)272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
FAG  
02/06

Patricia A George  
Examiner  
Art Unit 1765

**NADINE G. NORTON**  
**SUPERVISORY PATENT EXAMINER**  
